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ABSTRACT

The need to focus upon the organizational factors and consequences of a technological innovation is discussed and the outcome of the pilot implementation of the Academic Unit Planning Manual (AUPM) are reported. The primary intent of the AUPM, a tool developed at the National Center for Higher Education Management Systems (NCHEMS), is to assist academic unit administrators through an approach that addresses an academic unit's planning and management needs. The experiences of 37 academic unit administrators from six higher education institutions who attempted to improve their planning and management functions by utilizing the AUPM are described. Administrative variables (capacity, task understanding, effort-to-perform, and participation influence) and organizational system variables (openness, resource slack, job rewards, and administrative flexibility) were studied to determine their influence upon the applicability of the tool to attain various outcomes and to identify anticipated institutional consequences. The more popular uses of the tool, participant's insights about obstacles to implementation, and suggested methodologies for future implementations are also discussed and, from experiences gained through the field situation, some clues for research and management, such as the role of policies to regulate change attempts into the daily operations of the institutions, are included. (Author/JMD)

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AN EMPIRICAL STUDY OF IMPLEMENTING
AN ACADEMIC UNIT PLANNING TOOL:
IMPLICATIONS FOR INSTITUTIONAL RESEARCH
AND MANAGEMENT

ABSTRACT

The paper argues that postsecondary education institutions need to focus more upon the organizational factors and consequences of a technological innovation and less of an emphasis upon technical attributes of an innovation and the innovativeness among adopters and organizations in any implementation effort. It describes the experiences of 37 academic unit administrators from six higher education institutions who attempted to improve their planning and management functions by utilizing the Academic Unit Planning Manual developed by the National Center for Higher Education Management Systems. Administrative variables (capacity, task understanding, effort-to-perform, and participation influence) and organizational system variables (openness, resource slack, job rewards, and administrative flexibility) were studied to determine their influence upon the applicability of the tool to attain various outcomes and to identify anticipated institutional consequences.

The paper also covers the more popular uses of the tool, participants' insights about obstacles to implementation, and suggested methodologies for future implementations.

Finally, from the experiences gained through the actual field situation, the paper discusses some clues for institutional research and management, e.g., the role of policies and procedures to regularize change attempts into the daily operations of the institution.

Glenn K. Miyataki

BACKGROUND

In postsecondary education (PSE) institutions, the need to identify "the factors influencing the use of a technological innovation" for planning and management is very prevalent today. Incremental decision-making strategies no longer have been adequate to deal with the rapid rate of change and the accompanying uncertainty. In most cases, more indepth analysis of academic programs and their operations are necessary to determine internal resource substitutions and reallocations against expansions of human and physical resources. The quality of program offerings versus quantity is of current interest as the higher education-bound population reaches stable numbers.

Consequently, planning and management innovations such as systems analysis, program budgeting, operations research, and management information systems have gained more importance since the late 1960's as they have been utilized as tools for the analyses of program planning and resource allocations. However, since tools cannot make the final judgments and decisions, and often choices or tradeoffs confronting a decision maker might be dictated by organizational circumstances, there has been a need to think more explicitly about the ways in which decision-making techniques and organization development (OD) practices may be integrated (Elden, Goldstone, and Brown, 1970; Huse, 1975).

Moreover, an increase in the development of technological innovations for use at the academic unit level in the early 1970's (Dyer and Mulvey, 1974; Hoenack, Meagher, Weiler, and Zillgitt, 1974; Virginia Polytechnic Institute, 1973; Dyer, 1973; Humphrey, 1974; Miyataki and Gray, 1975) began to raise questions and debate regarding the value of these innovations

to organizational functioning and the impact of implementation: there is little indication to date about how they can be diffused and implemented in a wide range of academic units and how planning and budgeting information obtained at the department level can be used for institutionwide benefit and change. Thus, one of the serious considerations for PSE decision-makers today is the practical problem of coping with individual and organizational variables that will most affect the perceived applicability of implementing a technological innovation.

There is an awareness, too, that organizations are interested in "planning" their alternative futures as a means to remain viable and flexible as internal and external factors attempt to influence their operations. As Elden and others (1970) recalled, the central challenge is to control change when it runs rampant and to create change when it is suppressed. It would seem that a fiscally constraining environment being experienced by postsecondary education institutions calls for innovation and the creation of change in the hope that a "look" ahead may uncover clues for making decisions (or for deciding not to) that will be beneficial in promoting change in the future.

Purpose of the Paper

The purpose of the paper is to report to the higher education research and planning and management community, the outcomes and consequences of the pilot implementation of the Academic Unit Planning Manual (AUPM) (Miyataki and Gray, 1975). The primary intent of the AUPM, a tool developed at the National Center for Higher Education Management Systems (NCHEMS), is to assist academic unit administrators through an integrated, comprehensive information-based approach that addresses the full range of an academic

unit's planning and management needs. It consists of six modules which help an academic unit administrator to: (1) identify and plan key functions, tasks, or academic programs, (2) analyze student and academic demand and their levels of activity, (3) inventory and plan faculty availabilities and specialties, (4) relate physical resources to the carrying out of functions, tasks, and programs identified earlier in Module 1, (5) reflect the sources of funds and budgeted costs for the unit, and (6) identify outcomes to be achieved for the period planned.

Three major topics will be covered in the paper:

- A description of the theoretical framework and the process used in the implementation.
- Description of the factors -- system and administrative variables -- which influenced the applicability of the AUPM, the more popular uses of the tool, methodologies for implementation, and obstacles that hindered the effort.
- Finally, the implications for institutional research and management are discussed.

FRAMEWORK AND PROCESS OF IMPLEMENTATION

In institutional research and management, it is becoming imperative for academic unit planning to play a larger role in bringing about institutional effectiveness and planning as administrators and faculty assess priority programs and overall institutional objectives. A greater understanding must be reached regarding the type and level of decisions that must be made by academic units (Featherstone, 1972), those that must be made or influenced by other levels of administration, and those that can be made jointly by the academic unit and other levels of administration. For

purposes of this paper, "academic unit" refers to the basic organizational unit of a postsecondary education institution within which education activities such as instruction, research, public service, student counseling, and so on are carried out -- for some institutions, this would be the academic department; for others, the division, school, or college. As Key (1970) mentions, if a department does not have a role as a functioning element in the total institution, it is a waste of time talking about how to be more efficient administrators.

A Theoretical Framework

To assess the pilot implementation of the Academic Unit Planning Manual, a theoretical framework was developed from an integration of organization theory, innovation research, and expectancy motivation theory. (See Figure 1.)

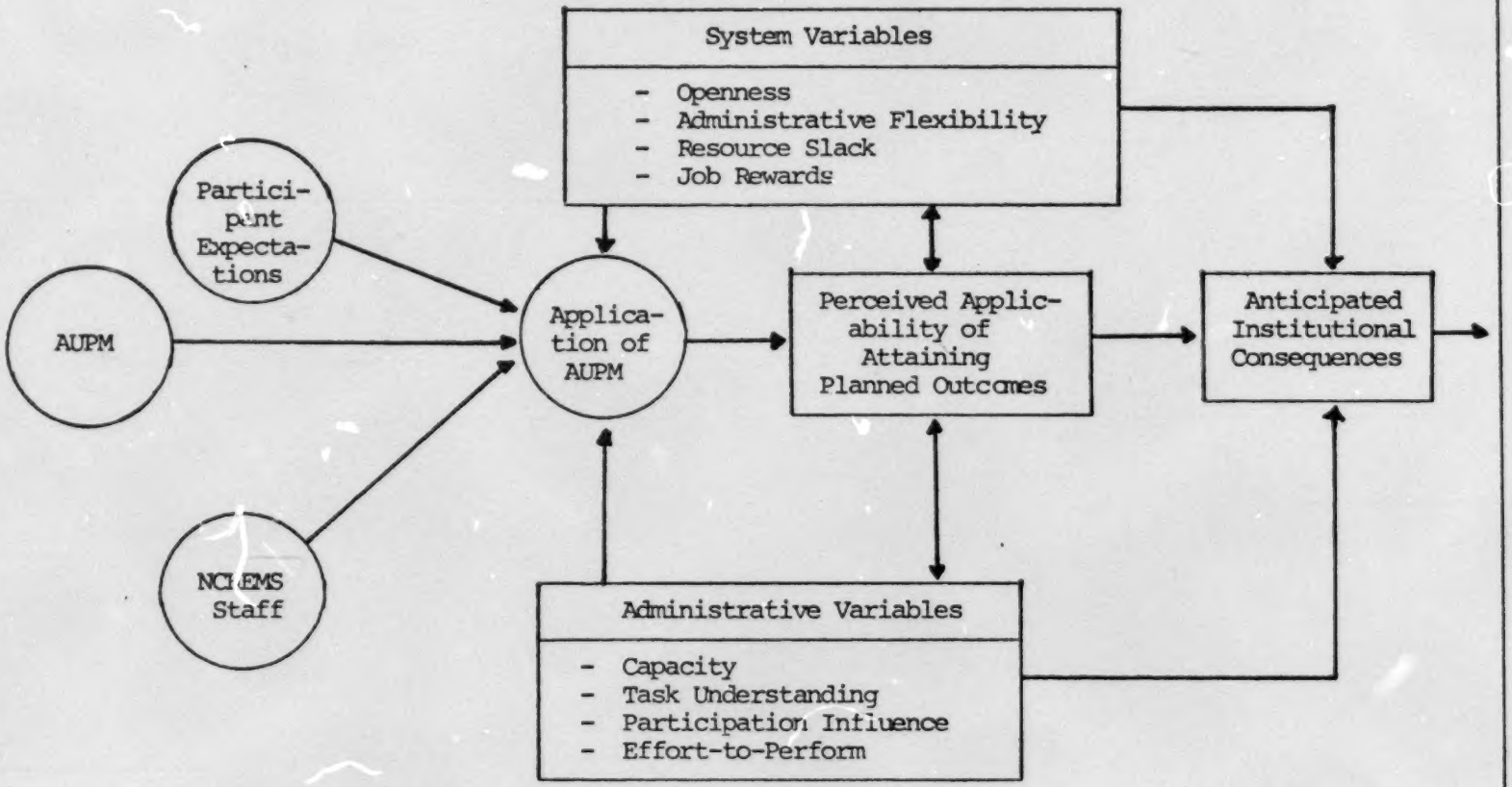
This model is based fundamentally on Evans' (1968) proposal that four major components influence the innovation process whereby an individual or organization becomes aware of, evaluates, and finally accepts or rejects an innovation. These are: (1) the innovation itself; (2) the innovation process -- introduction, promotion, and final adoption; (3) characteristics of the members of the social system; and (4) nature of the social system itself, or the context within which the innovation must be incorporated.

The study concentrated on component (3), member characteristics, and component (4), variables related to the social system itself, keeping the innovation and the implementation process constant for all subjects.

Briefly, the framework indicates that the innovation (AUPM) was attempted by clients within the institution who felt a need to bring about a change or to solve a planning and management problem. In their

FIGURE 1

A Theoretical Model for Assessing a Specific Technological Innovation, the AUPM



implementation, the administrators were assisted by the NCHEMS staff and by following a common set of guidelines for using any or all of the six AUPM modules.

From this attempt, the perceived applicability, i.e., the extent to which academic unit administrators utilizing the tool believed that it was useful in attaining specified outcomes, was evaluated as a function of the administrative variables of capacity, task understanding, participation influence, and the effort-to-perform (as predicated by expectancy theory) and system variables related to openness, administrative flexibility, resource slack, and job rewards present in an institution.

Finally, the likelihood that certain institutional consequences would occur was examined as a function of the major variables and the perceived applicability of the AUPM.

The Pilot Implementation Process

This study was conducted under the auspices of and in conjunction with the NCHEMS-sponsored pilot implementation of the Academic Unit Planning Manual (Miyataki and Gray, 1975) over a period of nine months. In all, 37 academic unit administrators (2 academic vice presidents, 6 academic deans or associate deans, 11 department heads, 9 division/program directors, 3 research administrators, and 6 central level administrators) from six institutions participated in the pilot implementation of the AUPM. (See Table 1 for information about participants, their institutions, and motivation to participate.)

TABLE 1

GENERAL PROFILE AND MOTIVATION FOR EACH INSTITUTION TO PARTICIPATE IN THE PILOT EFFORT

Participating Institution	Type/Size	Position of Coordinators Who Participated	Participating Administrators and Academic Units	Objective or Motivation for Participation
A	Private, liberal arts, belong to Catholic Diocese. 75 faculty, 1,200 students.	Planning Director	5 administrators from Applied Health Professions Division, Mathematics Department, and Education Department.	Use AUPM for identifying curricula interrelationships, lay groundwork for institutionwide academic planning.
B	Community College serving on industrial area of city. 165 faculty, 5,000 students.	(1) Vice President for Instructional Services and (2) Director of Institutional Research	4 central administrators and 3 deans of Liberal Arts, Vocational/Technical Education, and Continuing Education.	Reaffirm the functions and responsibilities of the key central offices of the college and develop a common framework for facilitating a collaborative approach to planning.
C	Land-grant State University. 1,300 faculty, 17,000 students.	Associate Dean of College	4 administrators of Biology Core Program, Department of Vocational Education, Department of Management Science and Information Services, and Department of Management.	Internal departmental management improvement. Identify planning considerations for organizing a newly established college.
D	Complex, research, urban University. 2,500 faculty, 32,500 students.	Senior Management Analyst	4 administrators from Electrical Engineering, Speech and Theater Arts, and Romance Language Departments and the College of Education.	Participation in academic planning by departments and colleges to improve internal management.
E	Four-year State College 105 faculty, 1,600 students.	Academic Vice President	4 division heads of Fine Arts, Biological Sciences Social Sciences, and General Studies.	Use AUPM to complement system currently used.
F	Upper division and graduate campus of State University System. 130 faculty 2,100 students.	(1) Assistant Director for Higher Education Research Center and (2) Research Assistant	Academic Dean and 4 division program heads of social science, elementary education, humanities, and public administration.	Program review, improve internal management, and information sharing.

The empirical study design consisted of a composite methodological and exploratory approach, supported by a mix arsenal of data collection methods: personal interviews, data checklists, feedback sessions, and expert advice. A survey instrument was developed during the beginning stages of the effort in an evolutionary fashion and then used in final form to evaluate the pilot implementation.

Each of the participants utilized a common set of procedures in attempting implemention over a period of 6-9 months. Moreover, at each institution, the following stages of implementation were accomplished:

- Exposing Stage: During this stage, a workshop was conducted for describing the capabilities and uses of the AUPM and the costs/benefits of participation, and group and individual meetings with key administrators from all institutional levels were held to identify the motivations for participation and a sense of commitment by the institution.
- Diagnosing Stage: Effort was spent here to explore expectations for participation, outcomes desired, planning and management needs, and organizational and administrative characteristics. In addition, a plan for implementation was developed.
- Doing Stage: Participants attempted to implement the AUPM during a period of five to six months. Site visits were made by the NCHEMS staff to assist in using the tool, examine work done to date, identify problem areas, and feedback information to all participants.
- Evaluating Stage: Participants assessed the effort by completing a survey instrument. In addition, a task force meeting for institutional coordinators was held to obtain suggestions for

improving the AUPM, to identify implementation methodologies, and to address the outcomes and obstacles of the pilot effort.

FACTORS INFLUENCING THE AUPM'S APPLICABILITY

In assessing the results of the pilot implementation, participants were asked to rate through a Likert-type scale their perceived applicability of the AUPM to achieve a specific set of outcomes. Then, the strength of their perceived applicability was related to several administrative and system variables as a means to determine their influence upon those outcomes attained. These variables were as follows:

- Outcomes -- "Simply anything an individual might want to attain" (Mitchell, 1974, p. 1053). In this study, "outcomes" refer to a specific set of results that administrators in higher education expected to attain in the area of planning and management. The specified outcomes for this study were: increased planning and management knowledge, increased collaboration between and among units, increased budget confidence, clearer unit priorities, clearer direction and scope, clearer information requirements, more informed resource allocation, clearer curriculum pattern, and clearer enrollment pattern.
- Effort-to-Perform -- The force to perform an act which is a monotonically increasing sum of the products of the valence of all outcomes and the strength of the person's expectancies that the act will be followed by the attainment of these outcomes (Vroom, 1964).
- Capacity -- As Havelock (1971) defined it, the "capability to retrieve and marshall diverse resources" (p. 11).

- Task Understanding -- The extent to which the administrator comprehended the guidelines for using the innovation; includes the degree to which the language and organization of the innovation hindered this understanding.
- Participation Influence -- The degree of willingness of the administrator to become involved with the pilot implementation of the AUPM.
- Openness -- Operationally defined by the direction of communication flow within the institution, the degree of acceptance of downward communication, the extent to which faculty ideas are sought by top management, and the receptivity of a unit's faculty toward systematic tools for planning and management.
- Administrative Flexibility -- The extent to which the administrator of a unit within the system perceives to have power to make decisions regarding the planning and use of budgets and resources.
- Resource Slack -- The amount of "organizational slack" present in the unit, that is, the disparity between the resources available to the organization and the payments required to maintain the coalition (Cyert and March, 1963).
- Job Reward -- The extent to which academic unit administrators who do their job well are provided with rewards, recognition, or reinforcements.

It was found in the study that effort-to-perform and participation influence were positively related to perceived applicability of the tool while job rewards were negatively related. Participants with a greater desire to attain outcomes or a higher expectation to accomplish outcomes

had a higher effort-to-perform score and therefore rated the tool's applicability higher. Those who volunteered to participate rated the tool higher in applicability than those mandated to participate. A curious result was that those who felt that job rewards were not being provided by their institution in recognition of good planning and management perceived the tool to be more applicable. Perhaps they were hopeful that doing good planning and management would encourage their institution to provide job rewards where they were not. In addition, administrators who felt that the tool met their own outcome needs indicated a higher likelihood that positive institutional consequences would occur.

The capacity of the administrator, clarity of task understanding, openness of the institution, administrative flexibility, and resource slack had very little impact upon the tool's applicability.

Other Results

Out of several intended uses of the tool, those suggested as being more helpful were to use the tool as; (1) a management training device to facilitate understanding of the interrelationships among curriculum, student demand for courses, faculty assignments, and the budget; (2) a self-study tool for in-depth examination of a unit's programs, and (3) a long-range planning tool to identify the scope and direction of a unit for the future.

The majority of administrators perceived that the use of the manual increased their knowledge of planning and management, improved collaborations with other academic unit administrators, identified more clearly the directions and scope of a unit's functions, and clarified a unit's information requirements.

With regard to obstacles that hindered implementation, it appeared to be quite crucial that the implementation effort be integrated with the regular operations of the institution in order for a higher chance of success. Treating the effort as an independent project lessened the chance for successful application of the tool. Moreover, the lack of a clear understanding of the role and nature of academic unit planning relative to an institution's overall institutional planning and management process seemed to have had an effect upon the implementation process. The majority believed also that the period selected for planning influenced the tool's applicability along with the level of information detail and amount of administrative time required to use the manual.

Participants also responded that a multifaceted approach should be taken in future implementations of the tool, including such strategies as assigning an institutional coordinator to oversee the innovation effort, general and specific workshop training in the tool's capabilities, and the development of a formal implementation plan prior to beginning any attempt.

IMPLICATIONS FOR INSTITUTIONAL RESEARCH AND MANAGEMENT

As institutions continue to evaluate the costs and benefits of implementing a technological innovation, institutional researchers will need to play a larger role in the identification of the outcomes and consequences of such efforts. The study, however, implies that in using any framework for assessing outcomes and consequences, it must include a component pertaining to the "effects" of implementation. The effects to be measured should include administrative and planning behvaior as well as changes in the existing task structure and processes of the institution. It is not sufficient, for instance, to note that collaboration among academic unit

administrators has increased; the different kinds of collaborations must be identified that have occurred as a result of implementing the innovation. Furthermore, it should be determined whether use of the tool actually changed the manner in which a task process was accomplished, and whether it influenced the institution to change its planning process or cycle in any way with improved results.

Institutional researchers must attempt to distinguish between the processes of (1) pilot implementation as a prerequisite to the decision to adopt an innovation and (2) actual implementation as a result of such a decision. These distinctions, if any, need to be clarified since the underlying commitment to the use of an innovation may be different for a pilot test and an actual implementation. The different levels of commitment will affect the degree of involvement of participants and thus the extent to which change will occur.

Institutional researchers must focus upon planning for change continuity. What are the needs and obstacles which an institution must identify to maintain continuity in a change effort? Planned organizational change must depend on the commitment of individuals to effect the change, along with the organizational policies that can facilitate that commitment. There is a need for institutional policies that will attempt to regularize the innovation into the normal operations of the institution as a means to retain continuity and achieve success in any pilot or actual implementation. In the absence of such policies or other alternatives to retain continuity, written or otherwise, change may be difficult to achieve. A study of this

concept of continuity in planned change may be necessary if the application of planning tools is to be successful for an institution in the long run.

In the final analysis, any effort to implement a planning innovation, pilot or actual, must pay attention to motivation theory as underlying the commitment of individuals in postsecondary education institutions to bring about change. Obvious as it may seem, very little attention is placed upon this aspect by institutions. Unless individuals can expect ~~implicit~~ intrinsic or ~~explicit~~ extrinsic benefits or incentives for innovation -- for their purposes as well as those of the institution -- successful implementation will be difficult. The challenges for institutional researchers and managers are not only the diagnosis of motivations but the development of (1) incentive system and policies for rewarding efforts or minimizing barriers to promote and accomplish change and (2) strategies for addressing obstacles to implementation that involve organizational attributes as well as the capabilities of the innovation.

If institutional researchers will tackle some of these challenges, then the implementation of academic unit planning tools and other technological innovations in postsecondary education institutions may have a better chance to succeed; those in postsecondary education should not take for granted that an innovation that appears to be useful can be made to succeed upon its merits, the formal authority structure, and by simply putting it into practice. The institution and its organizational processes are too complex to allow implementation without due regard for the outcomes and consequences of interest to organizational entities and members. Other empirical studies with organizational "bent" are necessary to better understand the impacts influenced by organization theory and innovation diffusion and effects of technological innovations.

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